APPENDIX A
MCNEIL CORE ANALYSIS FOR THE ST. REGIS RIVER SEDIMENT TMDL

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Introduction

Potential fine sediment impairment (siltation) within the St. Regis River mainstem and selected tributaries was evaluated by analyzing the distribution of streambed particle sizes. Streambed samples indicate the amount of fine sediment in the St. Regis River and several tributaries. This analysis attempts to evaluate potential impairment conditions by measuring both reference streams and streams that are potentially impaired. This analysis will provide baseline data for the development of a sediment TMDL for the St. Regis River while also providing a foundation for future monitoring.

Methods

In-stream Measurements using a McNeil Core Sampler

A McNeil core sampler was used to collect streambed samples and the percentage of fine sediment was determined. McNeil core samples were taken at six sites in the upper St. Regis River and at seven sites in tributaries (**Figure 2-17**). Tributaries sampled include the South Fork Little Joe Creek, North Fork Little Joe Creek, Ward Creek, Twelvemile Creek, Deer Creek, and Savenac Creek. In addition, a sample was collected on the West Fork Big Creek, though at the time of collection, the site was thought to be on Big Creek, which was the intended stream. Potential reference sites included Ward, Deer and Savenac Creeks, which are described on the 2004 303(d) List as fully supporting their beneficial uses. A site on the South Fork Little Joe Creek was also chosen as a potential reference site due to observed bull trout redds by Lolo National Forest fisheries biologists. In addition, samples were collected from gravel bars at three sites in the middle and lower St. Regis River that are thought to be aggrading. Overall, 16 sites were sampled. The McNeil core sampler was used at 13 sites and a small shovel was used at the three gravel bar sites. Four replicate samples were collected at each location for a total of 64 samples. All samples were collected in the early October 2003, and the sample sites were documented with GPS.

McNeil core samples were collected in pool tail-outs by embedding the 6-inch diameter base of the McNeil core sampler to a depth of 4 inches into the streambed. Material was then removed from the core until the jagged teeth at the base of the sampler were encountered (Shepard and Graham 1983). Particles larger than 64 mm along the intermediate axis were discarded so that the presence of a few large particles did not affect the percent fines (Church et al. 1987). Suspended sediment inside the corer was sampled with an Imhoff cone and allowed to settle for 20 minutes (Bunte and Abt 2001). Grid tosses were also performed at each of the McNeil core sample sites. A grid with 49 intersections was used for the grid toss and all particles smaller than the 6 mm intersections were counted.

A small shovel was used to sample the dry bed on gravel bars at sites that were thought to be aggrading. The same volume was collected in bar samples as in core samples. Samples were conducted by tossing a 6-inch metal hoop onto the gravel bar and excavating material to a depth of 4 inches. Gravel bar samples were conducted near the downstream end of the bar half way between the bankfull stage and the thalweg (Rosgen 1996).

Samples were dried and sieved in the laboratory using 50, 25, 12.5, 9.5, 6.3, 4.75, 2.36, 0.85, and 0.075 mm sieves. However, nothing was retained in the 9.5 mm portion of any sample and thus this category was removed from the final results. Material was dried in the laboratory and sieved for 20 minutes. Material from each sieve (including the pan) was weighed individually and the percent of the total sample was determined. Imhoff cone measurements were added to the pan weight. Samples were assessed for the percent of fine sediment, which is computed as the cumulative percent finer than a specified particle size (Bunte and Abt 2001). For this analysis, the percent of material finer than 6.3 mm, 2.36 mm, and 0.85 mm was calculated.

Results and Discussion

St. Regis Mainstem McNeil Core Samples

Mainstem McNeil core samples were collected in a variety of channel conditions ranging from highly channelized to completely unconfined. McNeil core samples were collected in Reaches 4, 7, 8, and 9 of the St. Regis River (**Table A-1**). Two samples were collected in Reaches 8 and 9 since these reaches are most likely to provide suitable spawning habitat. The Reach 9 sample was collected upstream of Interstate 90 and represents least impacted conditions along the mainstem of the St. Regis River. McNeil core samples averaged 6.6 pounds for each individual core and 26.39 pounds per sample site. The percent retained in each of the four core samples was averaged for each site and are presented as an overall site value in **Figure A-1**, while individual results for each core are presented at the end of this report. The GPS and river station location for sample sites are also listed at the end of this report.

Table A-1. Location, Rational, and Description of St. Regis River Mainstem McNeil Core Sample Sites

Sample Site	Location	Rational	Description
9	Just downstream of the upstream-most St. Regis River crossing	Potential indicator of least impacted conditions	Small channel with small woody debris
9B	Downstream of I-90 mile marker 2.5	Potentially loaded by traction sand due to I-90 proximity	Excessive fine sediment deposited in all slow flow areas
8	Just downstream of Hanakar Creek confluence	Potential spawning area	Active large woody debris forming pools
8B	Downstream of the Rest Area, along Hanakar Creek Rd	Potentially loaded by traction sand due to I-90 proximity	Boulder formed pools, partially associated with riprap
7	Upstream of Saltese Exit	Potentially loaded by traction sand due to I-90 proximity	Fine sediment almost totally absent, pools associated with riprap
4	A relatively undisturbed portion of river downstream of DeBorgia	Attempt to quantify accumulation of fine sediment in low gradient reaches	Large, meandering channel with wood aggregates

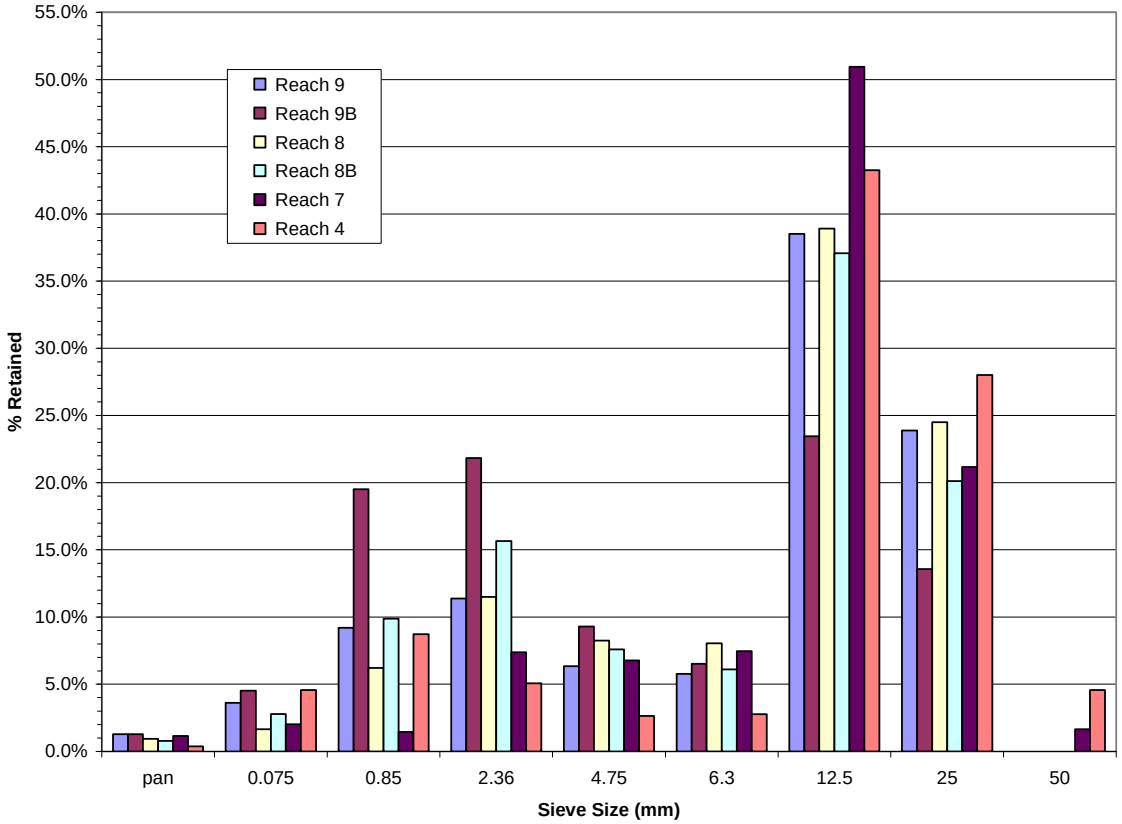

Figure A-1. Mean Percent Retained in Each Sieve Size for McNeil Core Samples along the Mainstem of the St. Regis River

McNeil core samples along the mainstem of the St. Regis River indicate areas of fine sediment accumulation. In reach 9B, 56.9% of the sample is finer than 6.3 mm as compared to 31.8% finer than 6.3 mm in the "least impacted" conditions in the Reach 9 core sample (**Table A-2**). The Reach 8 core sample, which is approximately 0.5 miles downstream of the Reach 9B core sample, has a much lower percent of fine sediment, with 28.1% finer than 6.3 mm. High percent fines are again apparent in the Reach 8B core sample, in which 37.3% of the sample is finer than 6.3 mm. The Reach 7 core samples taken in the channelized section of river upstream of Saltese have a low percent of fine sediment, with 19.2% finer than 6.3 mm. A low percent of surface fines in this reach is likely related to the highly confined channel. The percent of fine sediment in Reach 4 is also relatively low, with 20.5% finer than 6.3 mm. However, the Reach 4 sample was taken in braided channel conditions unlike any of the upstream samples. This site is more comparable to sites in which gravel bar samples were performed.

Table A-2. Mean Percent Finer than 6.3, 2.36, and 0.85 mm in Mainstem McNeil Core Samples

Sample Reach	% Finer than 6.3 mm	% Finer than 2.36 mm	% Finer than 0.85 mm
9	31.8%	14.0%	4.9%
9B	56.9%	26.8%	5.8%
8	28.1%	8.9%	2.4%
8B	37.3%	13.5%	3.7%
7	19.2%	4.9%	3.3%
4	20.5%	13.0%	4.7%

Results presented as the mean of 4 replicate samples.

St. Regis River Mainstem Gravel Bar Samples

Gravel bars were sampled at three sites along the St. Regis River that are thought to be aggrading (**Table A-3**). The gravel bar sample site in Reach 5 coincides with the Reach 5 physical survey site, which is located upstream of the Big Creek Road bridge outside of Haugan. Gravel bar samples in Reach 1 were conducted upstream of the Little Joe Creek bridge (Sample 1) and at the confluence with the Clark Fork River (Sample CF). Individual results for each gravel bar sample are presented at the end of this report.

Table A-3. Location, Rational, and Description of St. Regis River Mainstem Gravel Bar Sample Sites

Sample Site	Location	Rational	Description
5	Wide aggraded area upstream of the Big Creek Rd bridge	Attempt to quantify accumulation of fine sediment in low gradient reaches	Braided channel with extensive gravel bars
1	Upstream of Little Joe Creek	Attempt to quantify accumulation of fine sediment in low gradient reaches	Meandering channel with side channels containing fine sediment
CF	Just upstream of the confluence with the Clark Fork River	Attempt to quantify accumulation of fine sediment in low gradient reaches	Wide channel with mid-stream gravel deposits

The shovel method of collection employed on gravel bars varied from the technique used for McNeil core samples, though an attempt was made to collect the same size sample. Gravel bars samples averaged 4.9 pounds for each individual core and 19.43 pounds per sample site. The Reach 5 sample site has the greatest percent of fine sediment out of the three gravel bar sample sites, with 34.7% finer than 6.3 mm (**Table A-4**). This area may be one of the first places where fine sediment transported through channelized reaches upstream is deposited. All of the gravel bar samples contain a higher percentage of sediment finer than 0.85 mm when compared to any of the McNeil core samples, while the percent of sediment finer than 2.36 mm is also elevated compared to the mainstem core samples with similar percents finer that 6.3 mm.

Table A-4. Mean Percent Finer than 6.3, 2.36, and 0.85 mm in Mainstem Gravel Bar Samples

Sample Reach	% Finer than 6.3 mm	% Finer than 2.36 mm	% Finer than 0.85 mm
5	34.7%	21.2%	8.2%
1	18.2%	11.5%	6.1%
CF	27.2%	14.4%	7.4%

Results presented as the mean of 4 replicate samples.

St. Regis River McNeil Core Samples in Tributaries

McNeil core samples were collected in several tributaries of the St. Regis River that are either on the 303(d) List or are thought to be important salmonid spawning habitat (**Table A-5**). The listed tributaries for siltation (sediment) impairment in the St. Regis basin are Little Joe Creek, North Fork Little Joe Creek, Twelvemile Creek, and Big Creek. The South Fork Little Joe Creek, Ward Creek, Deer Creek, and Savenac Creek were sampled as potential reference conditions. The percent retained in the individual core samples was averaged for each site and is presented as an overall site value in **Figure A-2**, while individual results for each core are presented at the end of this report.

Table A-5. Location, Rational, and Description of Tributary Core Sample Sites

Sample Site	Location	Rational	Description
South Fork Little Joe Creek	8 miles upstream of the confluence with the NF of Little Joe Creek	Bull trout spawning redds documented	Pools formed by large woody debris, bull trout redds observed
North Fork Little Joe Creek	0.5 miles upstream of the confluence with the SF of Little Joe Creek	Bull trout spawning redds documented	Pools formed by large woody debris, bull trout redds observed
Ward Creek	Just upstream of the confluence with the St. Regis River	Stream gradient indicated a potential for spawning gravels	Pools formed by large woody debris and boulders
Twelvemile Creek	Just downstream of the old mill	Stream gradient indicated a potential for spawning gravels	Pools formed by small woody debris
Deer Creek	Approximately 1 mile upstream of the confluence with the St. Regis River	Stream gradient indicated a potential for spawning gravels	Pools formed by large woody debris and gravel bars
Savenac Creek	Approximately 2 miles upstream of the confluence with the St. Regis River	Stream gradient indicated a potential for spawning gravels	Generally lacked deposits of fine sediment, lateral scour pool sampled
West Fork Big Creek	Upstream of confluence with East Fork Big Creek, which marks the start of Big Creek	Stream gradient indicated a potential for spawning gravels	Pools associated with gravel bars

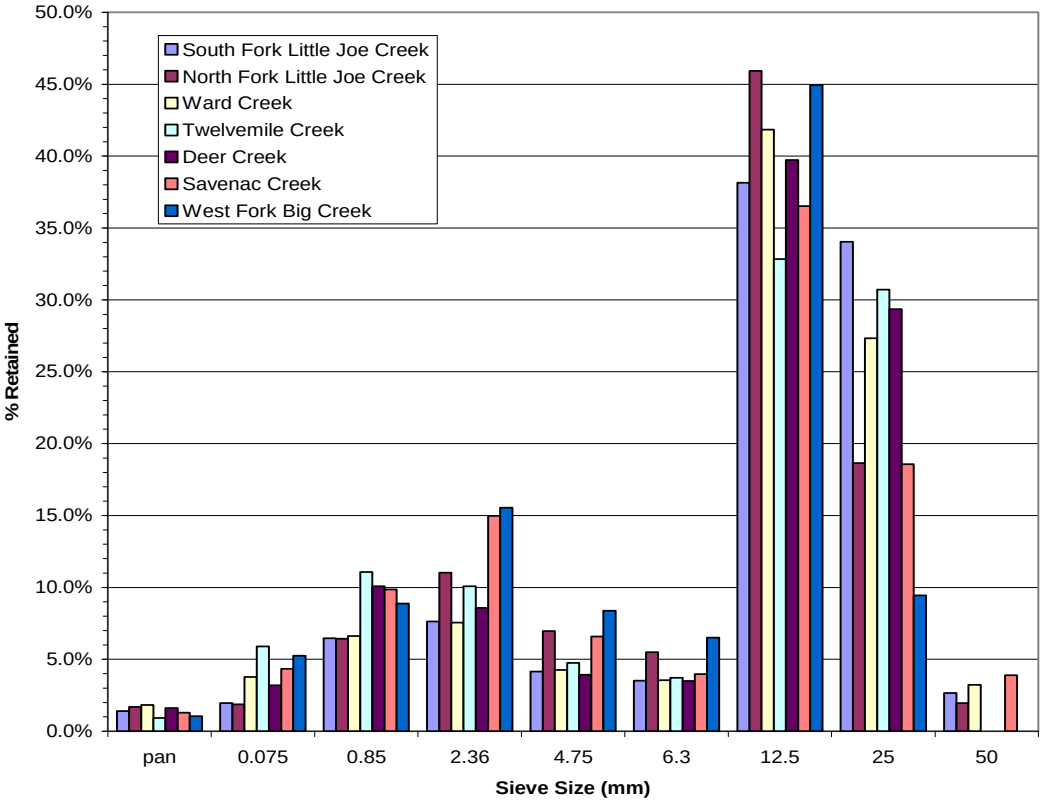

Figure A-2. Mean Percent Retained by Each Sieve Size for McNeil Core Samples Taken in Tributaries of the St. Regis River

McNeil core samples in the South Fork of Little Joe Creek and the North Fork of Little Joe Creek were collected in areas with observed bull trout spawning redds. McNeil core samples indicate that the South Fork of Little Joe Creek has the lowest percent of sediment finer than 6.3 mm (21.6%) and 2.36 mm (9.7%) of any St. Regis River tributary (**Table A-6**). The North Fork of Little Joe Creek has 27.6% finer than 6.3 mm and 9.5% finer than 2.36 mm. Ward Creek has 24.8% finer than 6.3 mm, Twelvemile Creek has 32.6% finer than 6.3 mm, Deer Creek has 27.8% finer than 6.3 mm, Savenac Creek has 36.8% finer than 6.3 mm, and West Fork Big Creek has 38.6% finer than 6.3 mm. Thus, Twelvemile Creek, Savenac Creek, and West Fork Big Creek have the highest percent of fine sediment. However, the Savenac Creek sample was performed in the only deposition of fine sediments identified in an extensive reach and these results may not apply to the creek as a whole.

Table A-6. Mean Percent Finer than 6.3, 2.36, and 0.85 mm in St. Regis River Tributary McNeil Core Samples

Tributary	% Finer than 6.3 mm	% Finer than 2.36 mm	% Finer than 0.85 mm
South Fork Little Joe Creek	21.6%	9.7%	3.4%
North Fork Little Joe Creek	27.6%	9.5%	3.4%
Ward Creek	24.8%	12.9%	6.0%
Twelvemile Creek	32.6%	20.3%	6.8%
Deer Creek	27.8%	15.0%	4.1%
Savenac Creek	36.8%	15.4%	5.6%
West Fork Big Creek	38.6%	14.7%	6.0%

Results presented as the mean of 4 replicate samples.

Relationship between McNeil Core Results and Grid-toss Results

The percent surface fines less than 6mm was assessed at each McNeil core sample site using a 49-point grid. In the St. Regis River, percent surface fines data collected using the grid-toss appear to be somewhat correlated with data collected using the McNeil core sampler, which assesses both surface and subsurface fines. Exceptions include Deer Creek, which had a fairly low McNeil core value, but the second highest grid-toss value, while Twelvemile Creek had one of the higher McNeil core values and a fairly low grid-toss value. Excluding these two sites, the other McNeil core samples sites with results <28% finer than 6.3mm are associated with grid-toss values of <8% finer than 6mm.

Table A-7. McNeil Core Results Presented from Lowest to Highest with Associated Grid-toss Result

Sample Reach/Tributary	McNeil Core % Finer than 6.3 mm	Grid-toss % Finer than 6mm
7	19.2%	6.8%
4	20.5%	4.6%
South Fork Little Joe Creek	21.6%	2.4%
Ward Creek	24.8%	3.6%
North Fork Little Joe Creek	27.6%	7.7%
Deer Creek	27.8%	22.4%
8	28.1%	10.5%
9	31.8%	15.3%
Twelvemile Creek	32.6%	7.8%
Savenac Creek	36.8%	13.6%
8B	37.3%	17.9%
West Fork Big Creek	38.6%	11.4%
9B	56.9%	45.9%

McNeil core results presented as the mean of 4 replicate samples. Grid-toss results presented as the mean of four grid-toss values collected in association with the four McNeil cores. Each grid-toss value was derived as the mean of three grid-tosses.

Conclusion

McNeil core samples in the mainstem of the St. Regis River and seven tributaries vary in the amount of fine sediment. McNeil core samples indicate excessive fine sediment accumulation downstream of the 0.6 mile stretch of river in which Interstate 90 is within 20 feet of the channel. The 2.0 mile stretch of river upstream of Saltese, in which the interstate is within 50 feet of the stream channel, has very little fine sediment accumulation due to a high transport capacity within this channelized reach. Overall, channelized reaches along the St. Regis River that have high transport capacities appear to easily transport the sediment load, which may then accumulate in unconfined reaches with lower gradients. Gravel bar samples suggest that the finer portion of the sediment load may accumulate in low gradient reaches. Thus, the road proximity and the degree of channel confinement appear to have a significant impact on sediment input and sediment transport in the St. Regis River.

Tributary samples collected in observed bull trout spawning gravels in the South and North Forks of Little Joe Creek average 21.6% and 27.6% finer that 6.3 mm, respectively. These values provide a basis for setting water quality targets in the development of a TMDL for the St. Regis watershed.

Literature Cited

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ATTACHMENT 1 FOR APPENDIX A: RAW MCNEAL CORE DATA:

Table A1-1: Percent Retained in Each Sieve Size for McNeil Core Samples and Gravel Bar Samples in the St. Regis Watershed

	R9-1	R9-2	R9-3	R9-4	R9B-1	R9B-2	R9B-3	R9B-4	R8-1	R8-2	R8-3	R8-4
Pan	2.2%	0.8%	1.2%	0.8%	1.3%	1.7%	0.6%	1.4%	1.6%	0.9%	0.3%	0.8%
0.074	4.1%	8.1%	2.4%	0.1%	2.3%	2.5%	6.1%	7.2%	2.8%	2.1%	0.5%	0.8%
0.85	12.8%	13.9%	7.2%	2.5%	23.7%	19.5%	19.8%	16.3%	7.0%	12.2%	2.6%	1.6%
2.38	10.2%	8.9%	12.6%	13.9%	30.1%	22.8%	18.8%	17.3%	14.6%	12.8%	11.9%	6.7%
4.76	4.7%	4.1%	7.2%	9.6%	7.1%	10.0%	7.8%	11.3%	10.8%	4.7%	8.7%	9.0%
6.3	4.9%	3.6%	7.2%	7.2%	4.7%	5.7%	4.9%	10.1%	9.6%	3.0%	9.9%	10.5%
12.7	31.1%	29.3%	46.7%	45.8%	24.0%	15.5%	23.4%	32.5%	40.3%	16.9%	43.7%	57.2%
25.4	30.1%	31.4%	15.6%	20.2%	6.9%	22.3%	18.5%	4.0%	13.4%	47.3%	22.5%	13.5%
50.8	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

	R8B-1	R8B-2	R8B-3	R8B-4	R7-1	R7-2	R7-3	R7-4	R4-1	R4-2	R4-3	R4-4
Pan	0.6%	0.5%	0.8%	1.3%	1.2%	0.6%	1.1%	1.9%	0.5%	0.4%	0.2%	0.3%
0.074	0.2%	2.8%	2.8%	5.5%	7.5%	0.2%	0.5%	0.2%	10.4%	5.9%	0.0%	0.9%
0.85	3.9%	14.7%	9.7%	11.0%	5.2%	0.2%	0.3%	0.4%	16.1%	13.7%	0.0%	3.4%
2.38	16.2%	14.1%	12.1%	21.5%	15.7%	3.7%	5.2%	5.7%	7.7%	7.2%	0.0%	4.9%
4.76	9.0%	5.1%	6.2%	10.8%	8.4%	4.4%	8.3%	6.3%	4.0%	3.3%	0.0%	3.0%
6.3	8.0%	4.1%	5.2%	7.7%	7.4%	5.7%	9.9%	6.9%	4.6%	3.0%	0.2%	3.1%
12.7	34.3%	29.3%	44.3%	40.0%	34.9%	53.2%	56.2%	59.1%	39.9%	31.5%	54.8%	48.4%
25.4	27.8%	29.4%	18.8%	2.2%	12.8%	32.1%	18.6%	19.5%	7.3%	27.5%	44.6%	36.0%
50.8	0.0%	0.0%	0.0%	0.0%	7.0%	0.0%	0.0%	0.0%	9.6%	7.5%	0.0%	0.0%

	R5-1	R5-2	R5-3	R5-4	R1-1	R1-2	R1-3	R1-4	CF-1	CF-2	CF-3	CF-4
Pan	1.1%	0.7%	0.3%	0.5%	0.4%	0.2%	0.5%	0.4%	0.3%	0.1%	0.2%	0.3%
0.074	11.8%	6.0%	6.5%	6.1%	7.8%	0.8%	7.0%	7.0%	3.4%	1.6%	13.4%	10.2%
0.85	17.7%	11.8%	11.3%	10.9%	8.3%	1.6%	6.7%	5.0%	5.8%	2.9%	9.4%	10.0%
2.38	14.7%	8.6%	6.1%	9.2%	4.7%	2.3%	5.4%	4.0%	10.9%	5.7%	5.8%	7.4%
4.76	6.0%	3.1%	2.6%	3.8%	3.1%	1.5%	3.0%	2.8%	8.8%	5.4%	2.7%	4.4%
6.3	4.5%	2.1%	2.4%	2.7%	3.1%	1.2%	2.9%	2.6%	8.2%	7.8%	2.3%	3.8%
12.7	25.4%	30.4%	32.5%	24.9%	29.4%	36.3%	40.8%	27.9%	55.7%	61.3%	28.5%	38.6%
25.4	18.7%	37.4%	38.2%	42.0%	20.2%	56.0%	33.6%	42.1%	7.0%	15.1%	37.7%	25.3%
50.8	0.0%	0.0%	0.0%	0.0%	23.0%	0.0%	0.0%	8.1%	0.0%	0.0%	0.0%	0.0%
76.2	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

CF = Sample taken just upstream of the confluence with the Clark Fork River

	SFLJ-1	SFLJ-2	SFLJ-3	SFLJ-4	NFLJ-1	NFLJ-2	NFLJ-3	NFLJ-4	W-1	W-2	W-3	W-4
Pan	1.0%	2.6%	0.5%	1.4%	2.1%	2.1%	1.9%	0.6%	3.3%	1.2%	2.4%	0.7%
0.074	0.4%	2.5%	2.1%	2.9%	2.4%	0.6%	3.3%	0.7%	10.4%	2.6%	3.1%	0.3%
0.85	3.8%	8.8%	7.8%	5.0%	7.8%	3.4%	10.6%	2.6%	10.4%	7.7%	8.5%	0.9%
2.38	9.8%	7.1%	6.9%	6.9%	9.3%	10.6%	11.0%	13.2%	8.6%	8.6%	9.9%	3.5%
4.76	6.0%	3.5%	3.7%	3.4%	4.9%	6.9%	6.0%	10.2%	4.3%	4.1%	4.8%	3.9%
6.3	5.4%	2.8%	2.7%	3.3%	3.2%	5.4%	4.6%	9.0%	2.9%	2.5%	3.5%	5.0%
12.7	44.0%	31.9%	31.9%	46.5%	35.6%	51.7%	42.1%	56.6%	43.1%	36.8%	39.1%	47.9%
25.4	29.5%	30.6%	44.3%	30.6%	27.1%	19.2%	20.4%	7.1%	16.9%	36.5%	28.8%	26.1%
50.8	0.0%	10.2%	0.0%	0.0%	7.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	11.7%
76.2	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

SFLJ = South Fork Little Joe Creek, NFLJ = North Fork Little Joe Creek, W = Ward Creek

	TM-1	TM-2	TM-3	TM-4	D-1	D-2	D-3	D-4	SAV-1	SAV-2	SAV-3	SAV-4
Pan	0.6%	1.0%	0.7%	1.5%	1.6%	1.4%	1.0%	2.3%	1.3%	1.3%	1.1%	1.5%
0.074	3.2%	4.1%	12.8%	3.5%	3.9%	2.3%	2.5%	4.2%	6.0%	3.1%	3.6%	4.5%
0.85	7.8%	13.4%	13.5%	9.4%	7.7%	7.8%	13.3%	11.7%	10.2%	9.2%	8.9%	11.1%
2.38	8.8%	12.0%	9.3%	10.1%	7.6%	3.9%	14.0%	9.6%	20.1%	12.5%	12.4%	14.4%
4.76	4.6%	5.1%	4.2%	5.1%	4.6%	1.3%	6.1%	4.3%	9.6%	5.2%	5.3%	5.8%
6.3	4.2%	3.6%	3.1%	3.9%	4.8%	1.3%	4.8%	3.7%	6.1%	3.1%	3.0%	3.4%
12.7	39.2%	25.2%	32.2%	35.2%	39.4%	43.1%	42.6%	33.7%	37.4%	35.1%	35.8%	37.8%
25.4	31.7%	35.6%	24.3%	31.2%	30.3%	38.9%	15.6%	30.5%	9.2%	22.7%	22.0%	21.4%
50.8	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.8%	8.0%	0.0%

TM = Twelvemile Creek, D = Deer Creek, SAV = Savenac Creek

	B-1	B-2	B-3	B-4
Pan	0.5%	1.0%	1.7%	1.0%
0.074	1.7%	11.9%	3.5%	2.8%
0.85	6.7%	13.0%	6.2%	8.9%
2.38	15.4%	16.9%	14.8%	14.8%
4.76	7.6%	9.0%	8.6%	8.2%
6.3	5.8%	6.6%	7.0%	6.5%
12.7	48.9%	41.6%	38.1%	51.4%
25.4	13.4%	0.0%	20.1%	6.4%
50.8	0.0%	0.0%	0.0%	0.0%

B = West Fork Big Creek

Table A1-2: River Stationing and GPS Location for McNeil Core Samples and Gravel Bar Samples within the St. Regis Watershed

Reach	River Station	Latitude	Longitude	Sample	Sample	Sample	Sample
9	195,800	47.443785	-115.704562	1	2	3	
9B	181,000	47.436809	-115.657176	2	3		
9B	181,000	47.436518	-115.657836	4			
8	178,000	47.432832	-115.654533	1	2		
8	178,000	47.432393	-115.653277	3	4		
8B	167,500	47.415734	-115.618529	1	2		
7	140,000	47.413768	-115.522239	1			
7	140,000	47.414076	-115.522380	2	4		
5	105,000	47.385487	-115.404201	1			
5	105,000	47.386065	-115.404949	2	4		
5	105,000	47.388491	-115.408164	3			
4	82,000	47.364370	-115.334218	1	2		
1	12,000	47.296622	-115.123602	1			
1	12,000	47.298289	-115.129649	2			
1	12,000	47.298565	-115.130890	3	4		
CF	500	47.297341	-115.090123	1	2		
CF	500	47.297178	-115.092122	3	4		
SFLJ	NA	47.188233	-115.224824	1			
SFLJ	NA	47.191749	-115.225556	4			
NFLJ	NA	47.264108	-115.162854	1			
NFLJ	NA	47.262046	-115.168064	3			
W	NA	47.311951	-115.234382	4			
TM	NA	47.356418	-115.287835	1			
D	NA	47.371216	-115.360597	2			
D	NA	47.372602	-115.360581	3			
SAV	NA	47.398399	-115.395667	1	2	3	4
B	NA	47.362692	-115.437141	1			
B	NA	47.362494	-115.436545	3	4		